

CLAIMS:

1. (Currently Amended) A method of controlling a valve; the method comprising:
moving a valve plunger to a first position ~~at a first speed~~, wherein the plunger in the first position positions a diaphragm against a valve seat using a first force that does not create a tight seal ~~applies a first force against a diaphragm closing the valve but not creating a seal; and~~

moving the plunger to a second position ~~at a second speed~~, wherein the plunger in the second position applies a second force against the diaphragm which fully seals the valve, ~~and~~ wherein the first force is less than the second force, and whereby impact loading on the diaphragm against the valve seat is minimized.

2. (Original) The method of Claim 1, further comprising applying a first signal to an actuator to cause the movement to the first position.

3. (Original) The method of Claim 1, further comprising applying a second signal to an actuator to cause the movement to the second position.

4. (Original) The method of Claim 1, further comprising positioning a valve plunger to touch a valve diaphragm when the valve is in the first position.

5. (Original) The method of Claim 4, further comprising squeezing the valve diaphragm closed during movement to the second position.

6. (Original) The method of Claim 1, further comprising applying a signal which causes the valve to fully open.

7. (Currently Amended) A precision controlled fast valve comprising:
a diaphragm;
a plunger which travels linearly within a bonnet of the valve, wherein the plunger is configured and operative to engage the diaphragm ~~to create a seal which closes the valve~~ using one of a first force that does not create a tight seal and a second force which fully seals the valve;
and

an actuator attached to the plunger, the actuator configured and operative to receive control signals and, responsive to the control signals, to control the distance and speed of linear travel of the plunger and the ~~force~~ first and second forces with which ~~the plunger engages~~ the diaphragm engages the valve seat, whereby impact loading on the diaphragm against a valve seat is minimized.

8. (Currently Amended) The precision controlled fast valve of Claim 7, wherein the plunger travels to a first position at a first speed, wherein the first position positions ~~the plunger proximate to the diaphragm against the valve seat using the first force~~ but does not create a seal.

9. (Currently Amended) The precision controlled fast valve of Claim 8, wherein the travel to the first position ~~at the first speed~~ is defined by a first control signal sent to the actuator.

10. (Currently Amended) The precision controlled fast valve of Claim 8, wherein the plunger travels to a second position at a second speed, wherein the plunger in the second position applies a second force against the diaphragm which fully seals the valve ~~positions the plunger to engage the diaphragm and create a seal.~~

11. (Currently Amended) The precision controlled fast valve of Claim 10, wherein the travel to the second position ~~at the second speed~~ is defined by a second control signal sent to the actuator.

12. (Original) The precision controlled fast valve of Claim 10, wherein the first speed is faster than the second speed.

13. (Previously Presented) The precision controlled fast valve of Claim 7, wherein the actuator is a piezo actuator.